

NASA Earth observation satellites enabling new approaches for applications and services



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REACH
—NEW—
HEIGHTS

BENEFIT
—ALL—
HUMANKIND

NASA MISSION OVERVIEW

REVEAL
—THE—
UNKNOWN



NASA MISSION DIRECTORATES



AERONAUTICS



SCIENCE



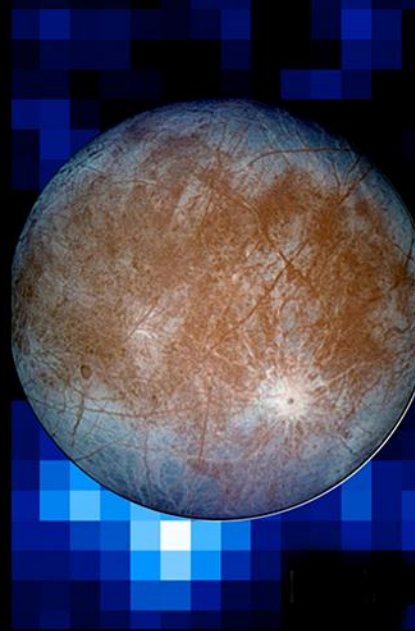
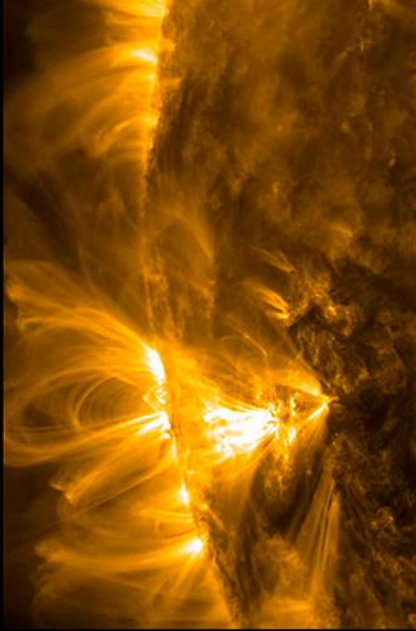
HUMAN EXPLORATION



SPACE TECHNOLOGY

SCIENCE MISSION DIRECTORATE

Research Divisions

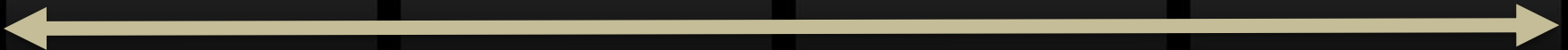


HELIOPHYSICS

EARTH
SCIENCE

PLANETARY
SCIENCE

ASTROPHYSICS



An Integrated Program of Science

FY17 Program of Record

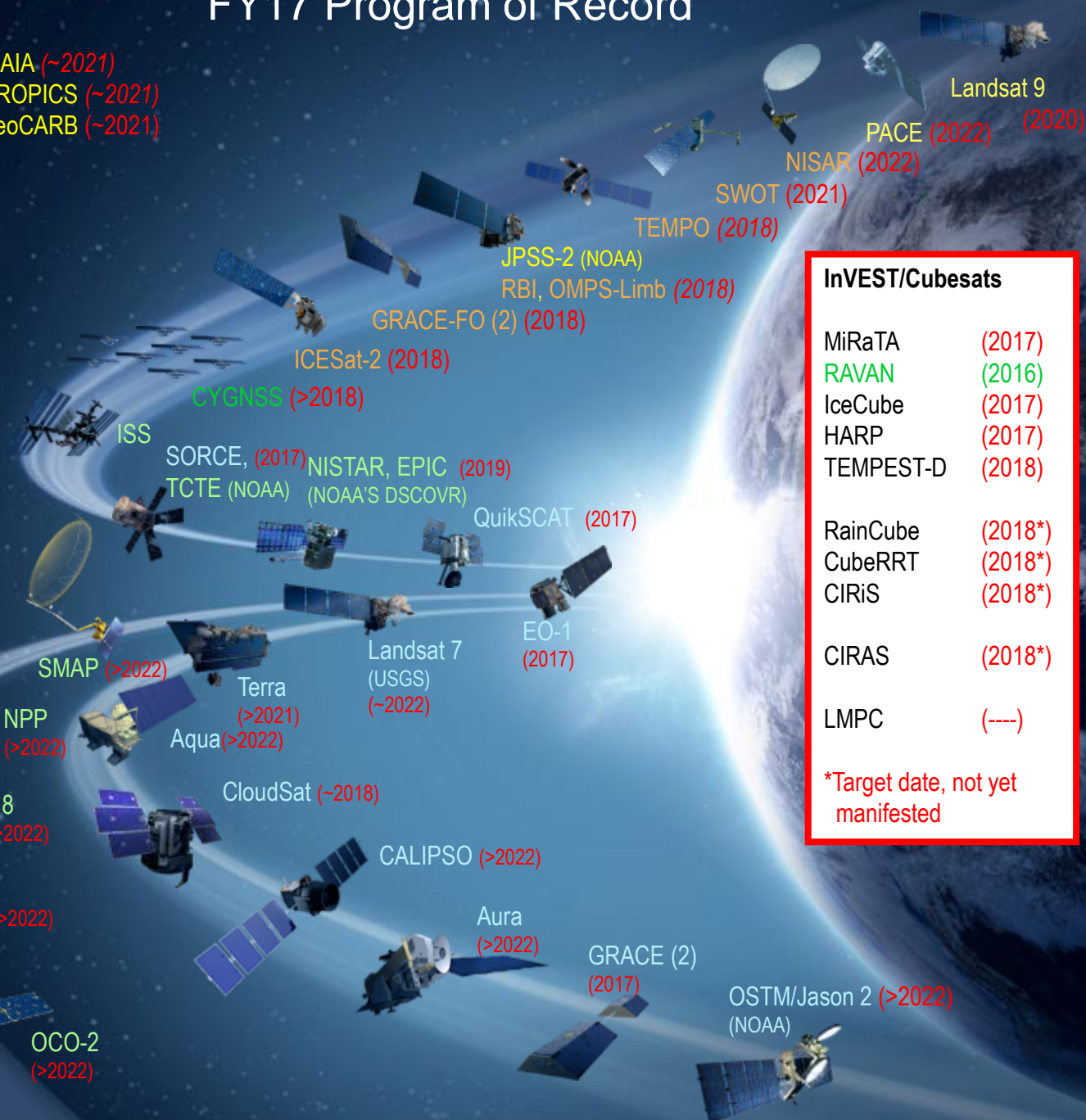
- Formulation
- Implementation
- Primary Ops
- Extended Ops

MAIA (~2021)
TROPICS (~2021)
geoCARB (~2021)

Sentinel-6A/B (2020, 2025)

Earth Science Instruments on ISS:

CATS, (2020)
LIS, (2020)
SAGE III, (2020)
TSIS-1, (2018)
ECOSTRESS, (2017)
GEDI, (2018)
OCO-3, (2018)
CLARREO-PF, (2020)
TSIS-2 (2020)



InVEST/Cubesats

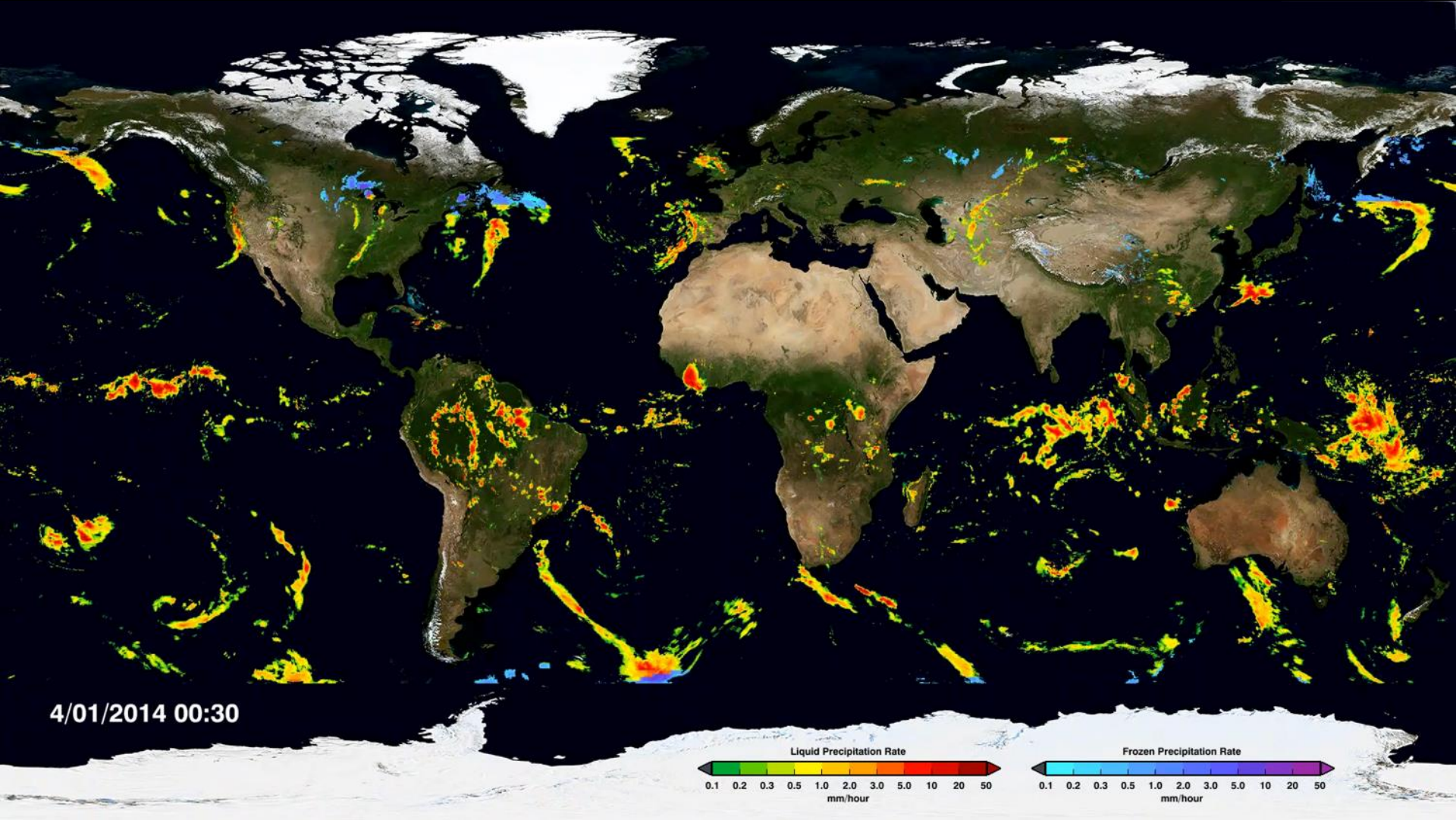
MiRaTA	(2017)
RAVAN	(2016)
IceCube	(2017)
HARP	(2017)
TEMPEST-D	(2018)

RainCube	(2018*)
CubeRRT	(2018*)
CIRiS	(2018*)

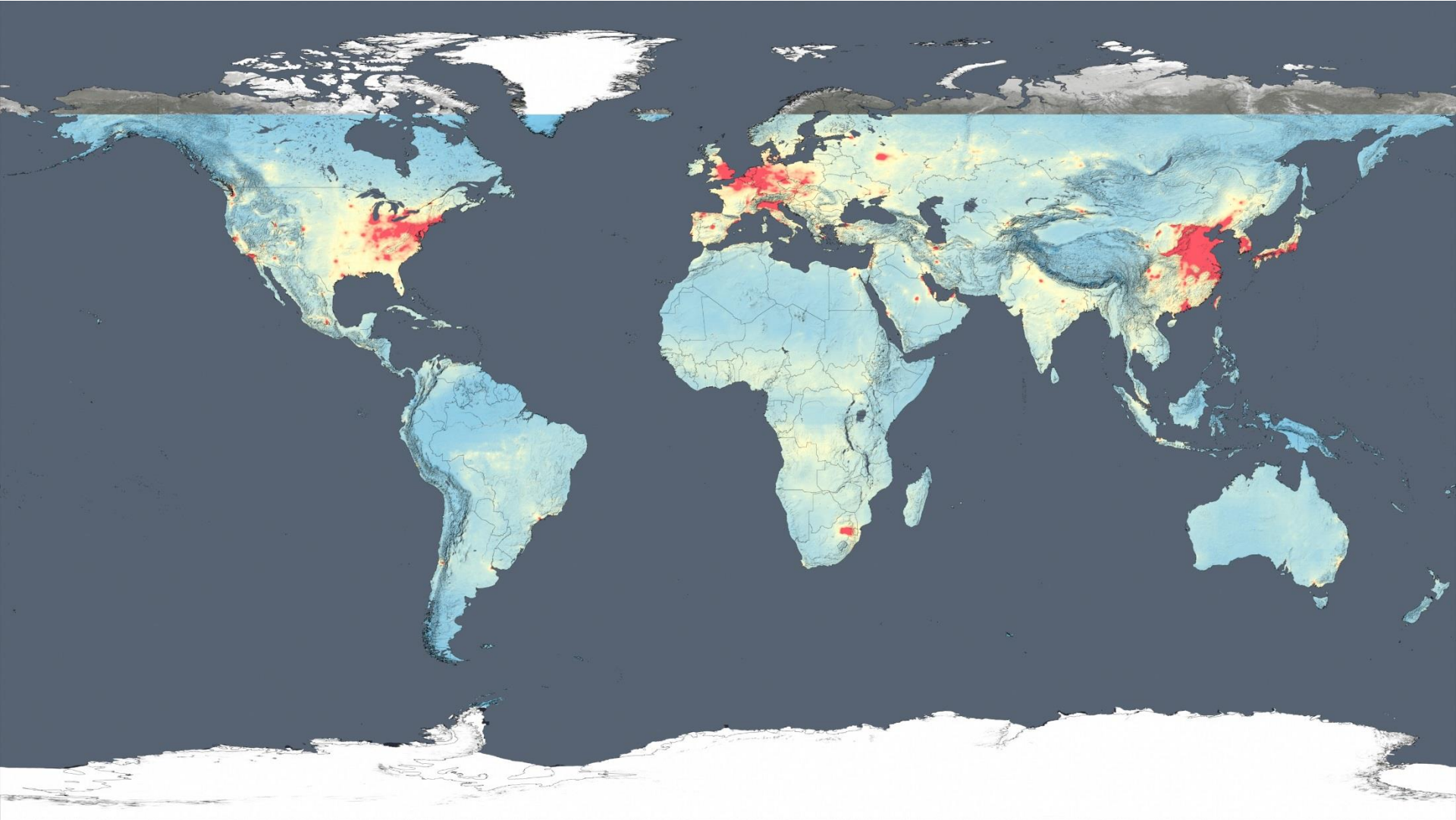
CIRAS	(2018*)
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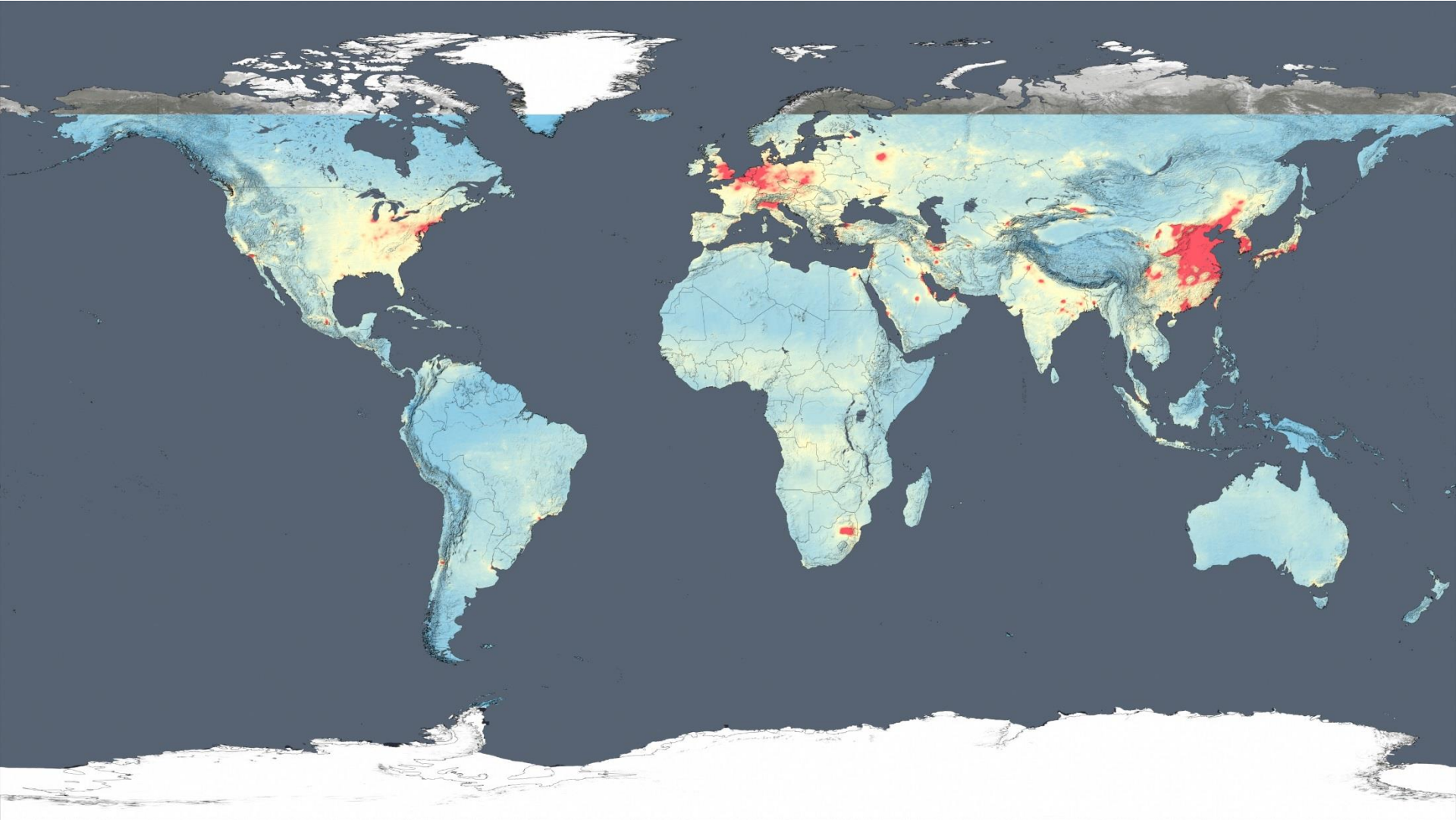
LMPC	(---)
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*Target date, not yet manifested



4/01/2014 00:30





NASA supports research to apply earth science to societal needs

NASA
Earth Science



Five Core Applications Areas



**Health &
Air Quality**



**Water
Resources**



**Ecological
Forecasting**



Disasters



**Wildland Fires
(through 2017)**

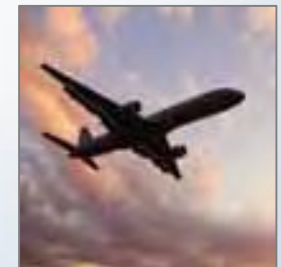
Additional Initiatives



Agriculture / Food Security



Energy



Transportation

Climate & weather play into all themes

BirdReturns: Earth Obs Informs Reverse Auction to Increase Habitat for Migrating Waterbirds



TEMPORARY HABITAT COSTS
LESS THAN ONE PERCENT
OF THE PRICE FOR PURCHASING
CONSERVATION LAND.

300+
bird species
use the
Pacific
Flyway

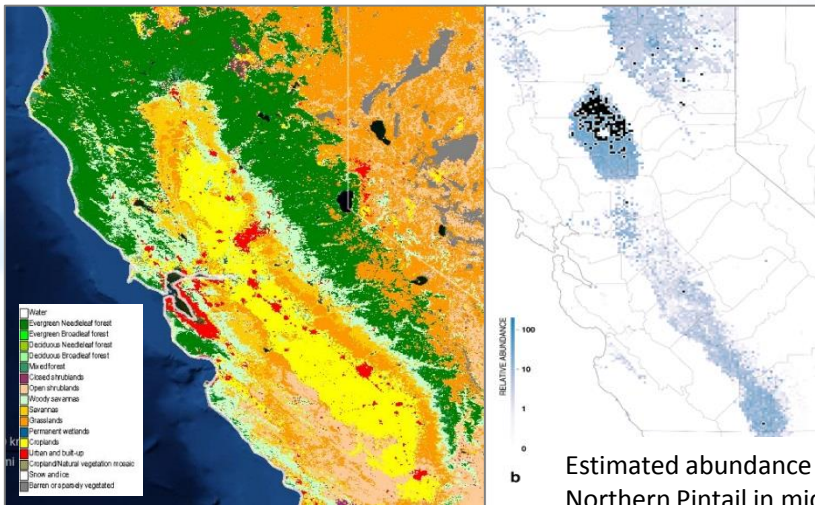


BIRD
OBSERVATIONS
LOGGED
WITH eBird

MODIS and ASTER data combined with citizen science reports from eBird drive bird habitat models and help TNC identify the best bird habitats

TNC uses a Reverse Auction:

- » Farmers submit bids to flood their fields during spring and fall migration
- » TNC reviews bids on price, migration projections, and other factors
- » TNC selects the best fields to flood for habitat at the best price; pays farmers.
- » And, farmland is only idle during migration

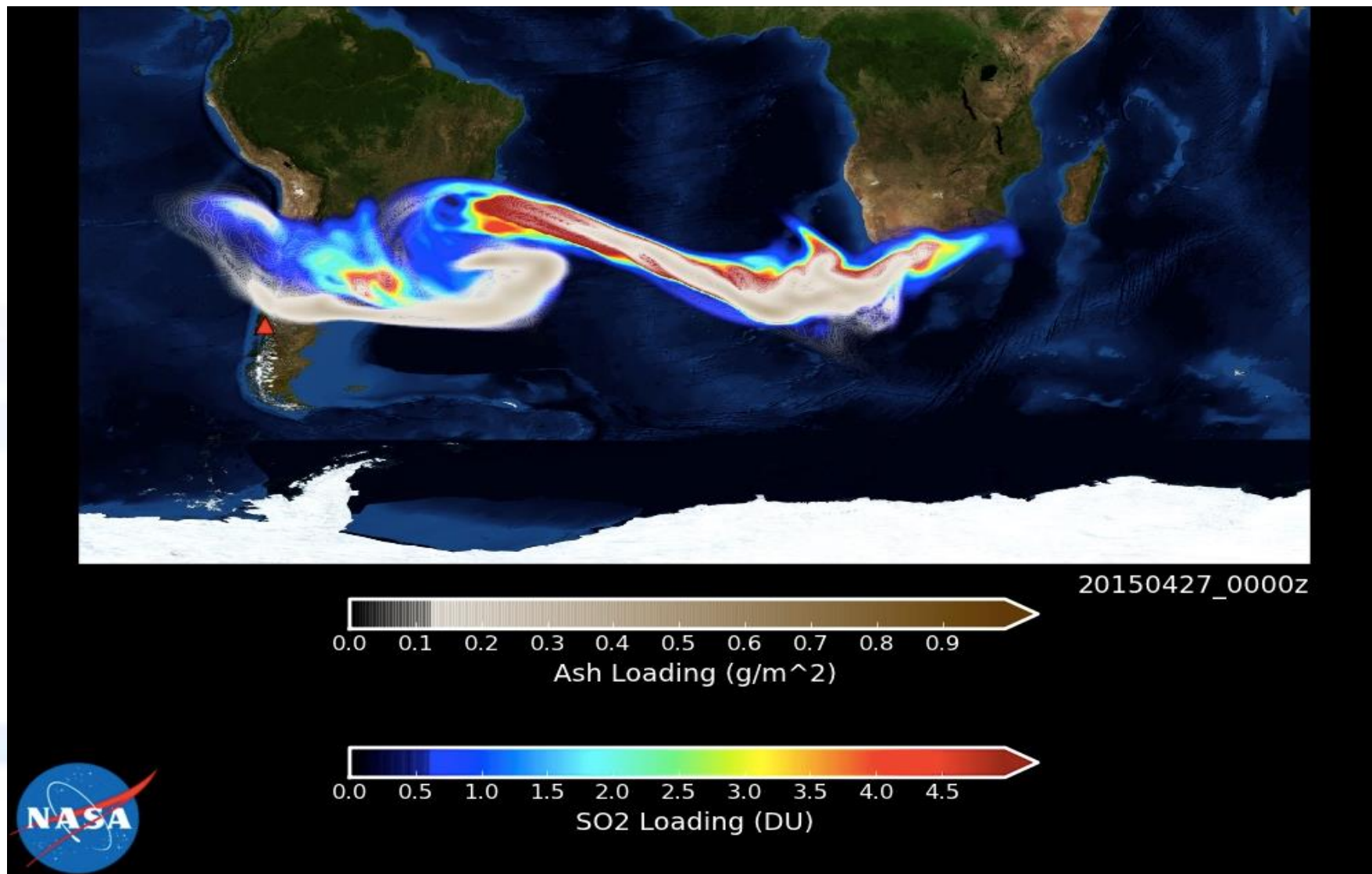


Estimated abundance for
Northern Pintail in mid-Jan.

30,000
acres

*Cumulative total of temporary
wetlands gained by end of 2015*

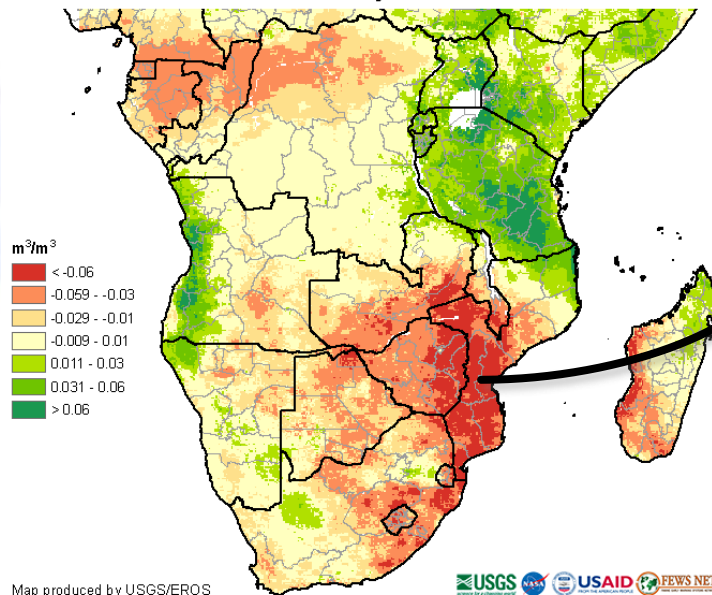
NOAA/NESDIS distributes NASA volcanic SO₂ data from the Aura satellite's Ozone Monitoring Instrument (OMI) to operational users in near real-time.



Famine Early Warning Decision Support with NASA's Land Information System (LIS)

The Famine Early Warning Systems Network (FEWS NET) uses NASA's Land Information System (LIS) to monitor agricultural and water resources in Africa. The strong 2015/16 El Niño exacerbated drought conditions in Southern Africa (lower left), negatively impacting livestock, crops and food security (lower right).

Soil Moisture (10-40 cm) Anomaly
January 2016



"Zimbabwe declares 'state of disaster' due to drought: More than quarter of population face food shortages as country hit by severe drought, with cattle dying and crops destroyed"

-The Guardian, 5 February 2016

Early warning systems help optimize the distribution of limited humanitarian aid resources. NASA satellite datasets are used to corroborate modeled estimates of quantities such as soil moisture. FEWS NET, USAID and USGS use these datasets to create visualizations that meet the needs of the humanitarian community.

NASA's Capacity Building Program (CBP)

Engaging current and future decision makers in a spectrum of activities to improve skills and capabilities in the United States and developing countries to access and apply NASA Earth science



ARSET

Online and hands-on
NASA remote
sensing training

24 *Led by NASA Goddard*



DEVELOP

Dual workforce capacity
building using collaborative
feasibility projects

Led by NASA Langley



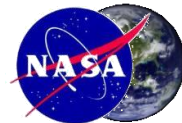
SERVIR

Building international
capacity in
developing countries

Led by NASA Marshall

Useful sites for NASA Earth Science Data and Products

NASA
Earth Science



- NASA Earth Science Data: <http://earthdata.nasa.gov>
- NASA Near Real Time Data:
<http://earthdata.nasa.gov/lance>
- NASA Worldview: <http://earthdata.nasa.gov/worldview>
- Fires: <http://earthdata.nasa.gov/firms>
- Flooding: <http://floodobservatory.colorado.edu/>
- NASA Images and Earth News:
<http://earthobservatory.nasa.gov>